

## CLAIMS

### WHAT IS CLAIMED IS:

5           1. A dehumidification unit comprising alternate laminations of an adsorption element (1) which supports an adsorbent and which is provided with a first air ventilation passage (3) through which air (Aa) to be processed is passed, and a cooling element (2) which is provided with a second air ventilation passage (4) through which cooling air (Ab) is passed,

10           wherein said first air ventilation passage (3) of said adsorption element (1) and said second air ventilation passage (4) of said cooling element (2) are adjacently formed, with a single plate member (P) lying between said first air ventilation passage (3) and said second air ventilation passage (4).

          2. The dehumidification unit of claim 1, wherein:

15           said plate member (P) is a side-plate member (12) which is made of fiber paper and which constitutes a side wall of said adsorption element (1) relative to the lamination direction thereof, and

          said side-plate member (12) directly faces said second air ventilation passage (4) of said cooling element (2) and, in addition, a separation sheet layer (14) configured to  
20           prevent the passage of gas and liquid is formed on a surface of said side-plate member (12) on the side of said second air ventilation passage (4).

          3. The dehumidification unit of claim 1, wherein:

          said plate member (P) is a side-plate member (22) which is formed by a metallic or resinous member and which constitutes a side wall of said cooling element (2) relative to  
25           the lamination direction thereof, and

          said side-plate member (22) directly faces said first air ventilation passage (3) of said adsorption element (1).

4. The dehumidification unit of claim 1, wherein:

said plate member (P) is a side-plate member (16) which is formed by a metallic or resinous member and which constitutes a side wall of said adsorption element (1) relative to the lamination direction thereof, and

5 an absorbent is supported on a surface of said side-plate member (16) which faces said first air ventilation passage (3).

5. The dehumidification unit of any of claims 1-4, wherein:

an air ventilation passage forming member (21) of said cooling element (2) is formed by a bending plate member shaped like a corrugated plate.

10 6. The dehumidification unit of any of claims 1-4, wherein:

an air ventilation passage forming member (21) of said cooling element (2) is formed by a bending plate member shaped like a trapezoidally corrugated plate.

7. The dehumidification unit of any of claims 1-4, wherein:

15 an air ventilation passage forming member (21) of said cooling element (2) is made up of a plurality of partition walls (23) vertically arranged in the thickness direction of said cooling element (2).

8. The dehumidification unit of claim 2, wherein:

said separation sheet layer (14) is formed by attachment of a plastic film, by vapor deposition of a metallic material, or by application of an organic binder.

20 9. An adsorption element in which a large number of air ventilation passages (3), (3), ... are formed on the inside of a single pair of tabular side-plate members (12), (12) spacedly opposed to each other and an absorbent is supported on the side of an interior surface of each of said air ventilation passages (3), (3), ...,

wherein:

25 said side-plate members (12), (12) are each formed of an air and moisture permeable material, and

either or both of exterior surfaces (12a), (12a) of said side-plate members (12), (12) are provided with waterproofing means (14).

10        10. An adsorption element in which a large number of air ventilation passages (3), (3), ... are formed at an interior surface (12b) of a tabular side-plate member (12) and an  
5        absorbent is supported on the side of an interior surface of each of said air ventilation passages (3), (3), ...,

          wherein:

          said side-plate member (12) is formed of an air and moisture permeable material,  
and

10        an exterior surface (12a) of said side-plate member (12) is provided with  
waterproofing means (14).

          11. The adsorption element of claim 9 or claim 10, wherein:

          as said permeable material of which said side-plate member (12) is formed, ceramic  
fiber paper, glass fiber paper, flame resistant paper, or nonwoven fabric is used.

15        12. The adsorption element of claim 9 or claim 10, wherein:

          said waterproofing means (14) is formed by attachment of a plastic film to said  
exterior surface (12a) of said side-plate member (12), by application of an organic binder  
to said exterior surface (12a), or by vapor deposition of a metallic material on said exterior  
surface (12a).

20        13. The adsorption element of claim 9 or claim 10, wherein:

          said waterproofing means (14) is partially provided only in a corresponding area of  
said exterior surface (12a) of said side-plate member (12) to a non waterproofing structure  
portion of said cooling element (2) which faces said exterior surface (12a).